

AMENDMENT UNDER 37 C.F.R. § 1.312
Application No.: 10/678,213
Attorney Docket No.: Q77101

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A portable ~~control, program and/or teach~~ terminal provided for the connection to a control unit of movements according to multiple axes of an automatic apparatus bearing a tool, the terminal having a longitudinally extended body defining a first portion and a second portion comprising an area of union to the first portion, wherein in correspondence with a front side of the first portion a display device is provided and in correspondence with a front side of the second portion a multiplicity of keys is provided, said multiplicity comprising:

a plurality of motion keys able to be operated manually to provide the control unit with a respective command signal for the apparatus, the command signal being aimed at causing the tool to execute a rotation or a translation motion about or along an axis corresponding to the operated motion key ,

a plurality of teaching keys, able to be operated manually for programming the control unit and/or controlling the apparatus and/or storing a position reached by a predefined point of the tool as a result of a motion of the apparatus ,

wherein

the second portion of the body of the terminal has a width which progressively decreases until reaching said area of union,

said plurality of motion keys comprises a first and a second series of keys being positioned

AMENDMENT UNDER 37 C.F.R. § 1.312

Application No.: 10/678,213

Attorney Docket No.: Q77101

each along a respective longitudinal side of the second portion, preferably in a substantially symmetrical fashion to each other, and

the said plurality of teaching keys comprises a group of keys being positioned within or close to said area of union.

2. (previously presented): The terminal as claimed in claim 1, the first series consists of keys for controlling translation movements and the second series consists of keys for controlling rotation movements.

3. (previously presented): The terminal as claimed in claim 1, the body comprises a rear part in which a longitudinally extended recess is defined, having two opposite longitudinal sides, each longitudinal side extending substantially parallel to a respective side surface of the second portion.

4. (previously presented): The terminal as claimed in claim 1, further comprising a safety device of the "dead man" type and the body comprising a rear part wherein a longitudinally extended recess is defined, from each of two opposite longitudinal sides of the recess a respective elongated button projecting towards the interior of the recess, each elongated button being part of the safety device.

5. (previously presented): The terminal as claimed in claim 1, further comprising selection means, able to be operated manually to select a desired co-ordinate system among a plurality of co-ordinate systems ("Base", "Tool", "Joints") stored in the control unit, that the operation of the motion keys depends on a selection made through the selection means and that said command signal is aimed at causing the tool to execute a rotation or a translation motion

AMENDMENT UNDER 37 C.F.R. § 1.312
Application No.: 10/678,213
Attorney Docket No.: Q77101

about or along an axis corresponding to the operated motion key, in the co-ordinate system ("Base, "Tool", "Joints") selected using the selection means .

6. (previously presented): The terminal as claimed in claim 5, further comprising additional motion control means, able to be operated manually instead of the motion control means, to provide the control unit with a respective signal for controlling the apparatus aimed at causing a displacement of the predefined point of the tool relative to a previously set reference point, where

the position of the reference point is capable of being modified,

the terminal comprises means for modifying the position of the reference point,

the signal for controlling the apparatus generated as a result of the operation of the additional motion control means is independent from the co-ordinate system ("Base, "Tool", "Joints") selected through the selection means.

7. (previously presented): The terminal as claimed in claim 6, wherein said additional motion control means is positioned in a central part of the second portion.

8. (previously presented): The terminal as claimed in claim 6, wherein said additional motion control means is positioned between the first and the second series of motion keys.

9. (previously presented): The terminal as claimed in claim 6, wherein said additional motion control means is able to be operated to cause Cartesian displacements of the predefined point of the tools relative to the set reference point.

AMENDMENT UNDER 37 C.F.R. § 1.312
Application No.: 10/678,213
Attorney Docket No.: Q77101

10. (previously presented): The terminal as claimed in claim 6, wherein said additional motion control means can be operated to cause angular or rotary displacements about a respective axis of the predefined point of the tools.

11. (previously presented): The terminal as claimed in claim 6, wherein the reference point is representative of the position of the terminal, and hence of a user who supports it, relative to the apparatus.

12. (previously presented): The terminal as claimed in claim 2, wherein said additional motion control means can be operated to cause a displacement of the predefined point of the tool closer, farther away, to the right, to the left, upwards or downwards relative to the position of the terminal, and hence of the user who supports it.

13. (previously presented): The terminal as claimed in claim 11, wherein said additional motion control means can be operated to cause a rotation of the predefined point of the tool about a respective axis, counter-clockwise or clockwise to the right, counter-clockwise or clockwise towards the position of the terminal and counter-clockwise or clockwise upwards.

14. (previously presented): The terminal as claimed in claim 11, wherein said additional motion control means comprise a compass knob able to be selectively operated in four lateral areas thereof to cause, in one of its operating modes, a displacement of the predefined point of the tool closer, farther away, to the right or the left relative to the position of the terminal.

AMENDMENT UNDER 37 C.F.R. § 1.312
Application No.: 10/678,213
Attorney Docket No.: Q77101

15. (previously presented): The terminal as claimed in claim 11, wherein said additional motion control means comprise a dual pressure key, able to be operated selectively at its two end areas to cause, in an operating mode thereof, a displacement of the predefined point of the tool upwards or downwards relative to the position of the terminal.

16. (previously presented): The terminal as claimed in claim 14, wherein the compass knob can be selectively operated in four lateral areas thereof to cause, in an additional operating mode, a displacement of the predefined point of the tool about a respective axis, counter-clockwise and clockwise to the right and counter-clockwise and clockwise towards the position of the terminal.

17. (previously presented): The terminal as claimed in claim 15, wherein the dual pressure key can be selectively operated at two end areas thereof to cause, in an additional operating mode, a rotation of the predefined point of the tool about a respective axis, counter-clockwise or clockwise upwards.

18. (previously presented): The terminal as claimed in claim 6, wherein said means for modifying the position of the reference point comprises an information input page capable of being displayed on the display device.

19. (previously presented): The terminal as claimed in claim 6, wherein said means for modifying the position of the reference point comprise means for generating graphic information on the display device, the graphic information being representative of the position of the reference point relative to the robot (1).

AMENDMENT UNDER 37 C.F.R. § 1.312

Application No.: 10/678,213

Attorney Docket No.: Q77101

20. (previously presented): The terminal as claimed in claim 19, wherein said means for generating graphic information comprise

means for generating on the display a first symbol, representative of the reference point,

means for generating on the display a second symbol, representative of the robot;

means for moving the first symbol relative to the second symbol using the first key, in particular along a substantially circular trajectory.

21. (previously presented): The terminal as claimed in claim 6, wherein said means for modifying the position of the reference point are part of a system for the automatic recognition of the angular position of the terminal relative to the apparatus.

22. (previously presented): The terminal as claimed in claim 21, wherein the automatic recognition system comprises signal emitter means and signal receiving means, the signal emitter means being operatively associated to one between the terminal and the robot and the signal receiver means being operatively associated to the other between the terminal and the apparatus.

23. (previously presented): The terminal as claimed in claim 1, wherein said group of keys comprises one or more keys selected in the group consisting of:

at least a key for varying the translation velocity of the robot, positioned in particular in the right part of the second portion, towards the centre thereof;

a key for starting a sequence of motions of the robot, positioned in particular in the right part of the second portion, towards the centre thereof;

AMENDMENT UNDER 37 C.F.R. § 1.312

Application No.: 10/678,213

Attorney Docket No.: Q77101

a key for stopping a motion of the robot, positioned in particular in the right part of the second portion, towards the centre thereof;

a key for selecting a desired co-ordinate system among a plurality of co-ordinate systems, positioned in particular in the left part of the second portion, towards the centre thereof;

a repetition key, which, when pressed, causes the robot to trace back one or more previously executed motions, positioned in particular in the right part of the second portion, towards the centre thereof;

a key for commanding the execution of individual steps of a previously set sequence of motions of the robot, positioned in particular in the right part of the second portion, towards the centre thereof;

a plurality of programming keys positioned in particular in the left part of the second portion and comprising at least multiple cursor keys, a data recording key, a data modification key.

24. (previously presented): The terminal as claimed in claim 1, wherein in the first portion, laterally to the display device, are positioned one or more function keys.

25. (previously presented): The terminal as claimed in claim 1, wherein in correspondence with an end area of the first portion are positioned a key selector and a mushroom head safety push-button.